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OPTICAL CABLE BRANCH CONNECTING CONSTRUCTION METHOD

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[There are no amendments to this patent.]

Claim

An optical cable branch connecting construction method characterized by the fact that in the operation of connecting a branch cable to an existing cable, there are the following process steps:

a step in which the existing cable jacket is opened at a distance toward the subscriber's side from the coated optical fiber connecting site that provides the extra length of coated optical fibers needed for connection, and the coated optical fibers that are the object of connection are cut;

a step in which the necessary extra length of coated optical fibers is obtained at the coated optical fiber connecting position by drawing the fibers in and pulling them out of the cable;

a step in which said extra length is used to perform connection of the branch cable;

and a step in which said cable jacket that has been opened to cut the coated optical fibers is again covered to be air tight.

Detailed explanation of the invention

Industrial application field

In the cable branching operation on the subscriber's side, branch connection and post-branch connection are usually performed. These will be explained first.

· Conventional branch connection:

In Figure 2,

(10A) represents a manhole;

(20) represents the entirety of the optical cable;

(21) represents the coated optical fibers of lines in use;

(22) represents the coated optical fibers of lines not in use (idle coated optical fiber);

(30) represents a coated optical fiber connecting part;

and (40) represents a connecting box.

In this scheme, when a new subscriber located near manhole (10A) with said connecting parts is to be connected, connecting box (40) is opened, and coated optical fiber (52) of branch cable (50) is connected to coated optical fibers (22).

This is a conventional branch connection.

Also, for both coated optical fibers (22) and (52), one line is used to indicate coated optical fibers in the necessary number. For coated optical fibers (21), two lines are used to indicate a great number of coated optical fibers.

. Post branch connection:

As shown in Figure 3, when a new subscriber connection takes place near manhole (10B) with through-laid lines (without connecting parts), cable jacket (24) is opened, and coated optical fibers (22) and coated optical fibers (52) are connected.

This is a post-branch connection.

Among these connection schemes, the present invention pertains to said post-branch connection.

Prior art and problems to be solved

In the case of a conventional metal [electrical] cable, the extra length needed for the operations of connector connection, manual twisting connection, and soldering may not be great. Consequently, a post-branch connection is relatively easy.

However, in the case of an optical cable, the post-branch operation is not nearly as easy as in the case of the metal cable.

With currently available technology, an extra length of at least 1 m is needed for both connector connection and fusion splicing.

Consequently, in the case of connector connection, it is necessary to bring the optical fiber to a device for polishing the end surface of the connector. In the case of fusion splicing, it is necessary to bring the optical fiber to the location of the fusion splicing device.

However, at present, the length of the cable connection part is about 500 mm, and the length of connecting box (40) is less than that. Consequently, it is impossible to pull out cable

jacket (24) further than that. As a result, it is impossible to get an extra length equal to or greater than the aforementioned length.

Although stripping cable jacket (24) for 1 m or more can get the required extra length of the coated optical fiber, in this case, the length of the covering connecting box to be applied later becomes two or more times that in the prior art.

In the prior art, the following method has been adopted in practical application.

As shown in Figure 4, even when a new subscriber hook-up takes place near through-laid manhole (10B), post-branch connection is still not performed in said manhole (10B). Instead, said conventional branch connection is performed at the nearest manhole (10A) having connecting box (40). When there is idle conduit (60), it is used to get branch cable (50) to said manhole (10B). From there, it is led to the subscriber's location.

Consequently, when branch cable (50) becomes longer, the distance occupied by multiple conduits also become greater. As a result, the number of man-hours of work on the conduit ultimately rises, and this is undesirable.

Means for solving the problems

According to the present invention, while the length of connecting box (40) is kept as is, the extra length needed for connection is obtained. As a result, it is possible to perform post-branch connection directly from the nearest manhole (10B) (manhole without connecting box (40)).

As shown in Figure 1, the important steps are as follows:

(1) cable jacket (24) is opened at position B a distance toward the subscriber's side from coated optical fiber connecting position A that provides the extra length needed for connection, and coated optical fibers (22) that are the object for connection are cut;

(2) at coated optical fiber connecting position A, said cut coated optical fibers (22) are drawn in and pulled out of cable (20) to get the necessary extra length.

Explanation of the present invention

(1) As shown in Figure 1, from branch connecting position A of existing cable (20) to position B 1-2 m (that is, the desired extra length) toward the subscriber's side, cable jacket (24) is opened (Figure 1(a)).

The necessary number of coated optical fibers (22) are then cut.

Only the length of cable jacket (24) needed to cut coated optical fibers (22) is opened. Consequently, the opening can be very short.

(2) At branch point A, only the length of cable jacket (24) needed for connection of the coated optical fibers (Figure 1(b)) is opened. Said cut coated optical fibers (22) are drawn from the opening and pulled out of optical cable (20).

(3) This makes it possible to get the extra length needed for connection. Then the post-branch connection is performed as shown in Figure 3.

(4) Then, at point B, outer case (42) is applied to cover cut cable jacket (24) to reestablish the air-tight state (Figure 1(c)).

Because said outer case (42) is used as a substitute for cable jacket (24), and its location is not the connecting point, it can be made small.

In the case of hand-hole

In the above the case of a manhole has been explained. In the case of a hand-hole where post-branch connection is performed in a tight space, the same method as aforementioned can also be adopted by taking the extra length of optical cable (20) itself.

Effects of the invention

The method of the present invention has the following process steps:

a step in which the existing cable jacket is opened at a distance toward the subscriber's side from the coated optical fiber connecting site that provides the extra length of coated optical fibers needed for connection, and the coated optical fibers that are the object of connection are cut;

and a step in which a necessary extra length of the coated optical fibers is obtained at the coated optical fiber connecting position by drawing the fibers in and pulling them out of the cable.

Consequently, even when there is a need for connection near through-laid manhole (10B), it is still possible to perform direct post-branch connection from said manhole (10B).

As a result, there is no need to perform the prior art operation shown in Figure 4, and it is possible to reduce the number of man-hours.

Also, there is no need to have a very long connecting box.

Brief description of the figures

Figures 1(a)-(c) are diagrams illustrating the steps in the scheme of an application example of the present invention.

Figures 2(a), (b) illustrate the conventional branch connection scheme.

Figures 3(a), (b) illustrate the conventional post-branch connection scheme.

Figure 4 is a diagram illustrating conventional post-branch connection of optical cables.

10A Manhole with connecting part

10B Manhole without connecting part

20 Optical cable

21 Idle coated optical fiber

22 Coated optical fibers of the line in use

24 Cable jacket

30 Coated optical fiber connecting part

40 Connecting box

42 Outer case

50 Branch cable

52 Coated optical fibers of branch cable

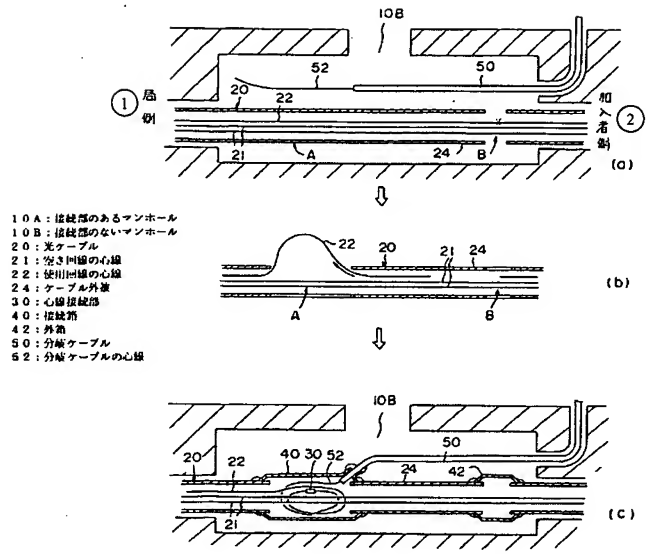

Figure 1

Key:

1	Station side
2	Subscriber side
10A	Manhole with connecting part
10B	Manhole without connecting part
20	Optical cable
21	Idle coated optical fiber
22	Coated optical fibers of the line in use
24	Cable jacket
30	Coated optical fiber connecting part
40	Connecting box
42	Outer case
50	Branch cable
52	Coated optical fibers of branch cable

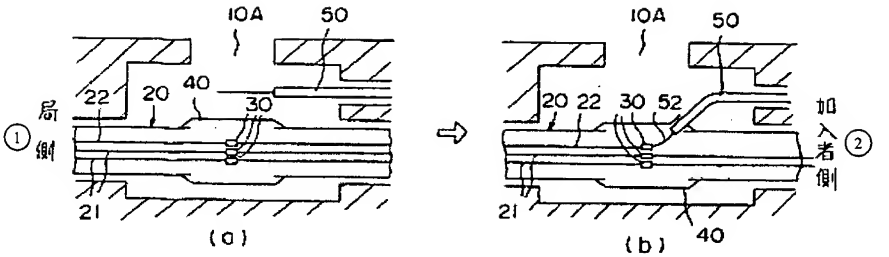

Figure 2

Key: 1 Station side
2 Subscriber side

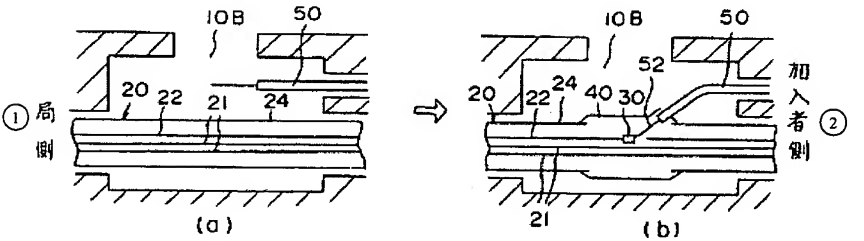

Figure 3

Key: 1 Station side
2 Subscriber side

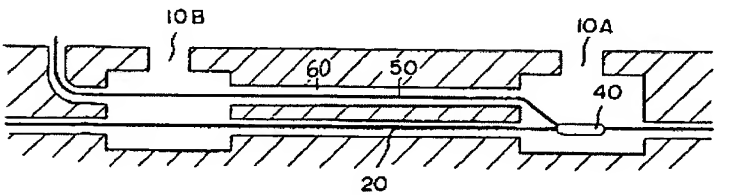

Figure 4